

REMARKS

Claim 25 has been amended. The other claims remain unchanged.

Turning to the prior art, none of these references discloses the "liquid jet" or moving column of liquid recited in each of the pending claims. As described at 0108, a liquid jet is a substantially solid or continuous column of liquid impacting the workpiece at a high velocity. None of the prior art suggests this element.

Torek *et al.* discloses a spray process using spray nozzles. Col. 2, lines 10-21. The spray may be pulsed, i.e., turned on and off in a duty cycle. Col. 5, lines 1-22. Pulsing is described as being advantageous in using less water, increasing ozone concentration, and washing away by-products. Col. 4, lines 36-58. A "spray" is a stream of moving droplets. The claimed jet is a substantially continuous column of moving liquid. In addition, nothing in Torek *et al.* suggests a liquid jet penetrating a boundary layer, as claimed. In addition, Torek *et al.* discloses a batch process with the spray from the nozzles directed nearly parallel to the wafers. See Fig. 3. Consequently, the concept of a liquid jet, or use of jet impact, is entirely missing from Torek *et al.*

DeGendt *et al.* US 2002/0011257 A1 makes no mention of a liquid jet penetrating a boundary layer. DeGendt *et al.* discloses a moist gas phase process in Fig. 3 and an immersion bubble up process in Fig. 8. DeGendt *et al.* also refers to spray processing at 0019 and 0077. However, nothing in DeGendt *et al.* suggests the claimed liquid jet.

JP 07-155714 is apparently cited in the office action for disclosing sonics. Dependent claim 20 is the only claim relating to sonics, but claim 20 describes

introducing sonic energy into a nozzle forming the liquid jet. JP 07-155714 does not disclose any liquid jet, and does not disclose any nozzles that introduce sonic energy. Rather JP 07-155714 describes "liquid injection nozzles 6a, 6b to remove foreign matter which has been peeled off of the substrate by ultrasonic vibrations from transducers 3a-3d on the parts 2a and 2b holding the substrate." See the Abstract. A machine translation of JP 07-155714 obtained from the JPO website is enclosed.

EP 782 177 also does not suggest the claimed liquid jet. In view of the comments at the bottom of page 3 of the 3/22/2006 Office Action, applicant requests that the Examiner reconsider the content of EP 782 177 in view of the following comments. EP 782 177 describes providing rinse water from a nozzle 11 on the side of the chamber. The nozzle is not directed at the workpiece, as claimed. Rather, the nozzle 11 sprays water parallel to the plane of the wafer. The water falls onto the wafer via gravity. There is nothing in EP 782 177 to suggest the claimed jet of liquid directed at the workpiece. The application of the rinse water in EP 782 177 is shown therein in Fig. 1, and is described as follows:

"The etched wafer is spun and rinsed by conducting a stream of deionized liquid water onto the spinning wafer...."

Page 2, lines 55-59.

"The present invention includes an anhydrous HF gas and water vapor etch process, the etching process being completed by a rinsing step which includes conducting a stream of deionized liquid water onto a spinning wafer with

anhydrous HF gas, HCL gas, ozone, or mixtures thereof
being present...." Page 3, lines 22-26.

"The rinse step may be controlled to meet the desired
results by adjusting the rinse time, the spin rate, and/or the
water flow rate." Page 3, lines 56-57.

Accordingly, EP 782 177 discloses use of a stream of rinse water, sprayed out in
a direction parallel to the surface of the wafer. None of Terek *et al.* USP 6,758,938,
DeGendt *et al.* US 2002/0011257 A1, JP 07-155714, or EP 782 177 suggest the
claimed liquid jet. Accordingly, the claims cannot be obvious over this combination of
prior art.

For the same reason, the claims cannot be obvious over the combination of
DeGendt *et al.* and EP '177 as set forth in the second grounds for rejection at page 4 of
the 3/22/2006 Office Action.

In view of the foregoing, it is submitted that the claims are in condition for
allowance. A Notice of Allowance is requested.

Dated: June 21, 2006

Respectfully submitted,

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